Science goals-Air chemistry over the Southeastern U.S.

- Track the changing chemistry between August and September
- Examine the interactions between natural and anthropogenic emissions
- Collaborate with Discover-AQ, SENEX
- Examine aerosol properties and ability to retrieve them remotely
- Investigate convective pumping into UTLS

PI ideas on science goals & flight planning: SE US Chemistry

- BL Chemistry & satellites:
  - Develop a consistent data set for BVOC-NOx-O3 distribution & chemistry
  - How reliable are sat derived formaldehyde and NO2 columns
  - How reliably can you relate HCHO columns to BVOC emissions
  - How does BVOC-NOx chemistry impact O3 over SE US
  - what is the impact of pollution incursions (urban, power plants etc) on chemistry in this region
  - How well can we relate the behavior of OA to BVOC-NOx chemistry
- Deep Convection
  - Can we conclusively relate the UT O3 maxima to chemistry associated with surface biogenic/anthropogenic precursors
  - Is the UT O3 maximum also elevated in aerosol and what is the composition
  - What are the scavenging efficiencies of gases and aerosols during deep convection and cloud interactions

- Clouds and Radiation
  - Develop a consistent data set of aerosol physical, chemical and optical properties
  - How does chemical processing in the convective systems modify chemical and optical properties of aerosols
  - Relate AOT to in situ aerosol observations
  - Provide observational data for polarimeter algorithm development

- other validations
  - FTS GHG validation (TCON)
  - Models

- Flight plans?? What we know/don't know?? How do we use or integrate with ER2?

Central questions for Southeast US chemistry

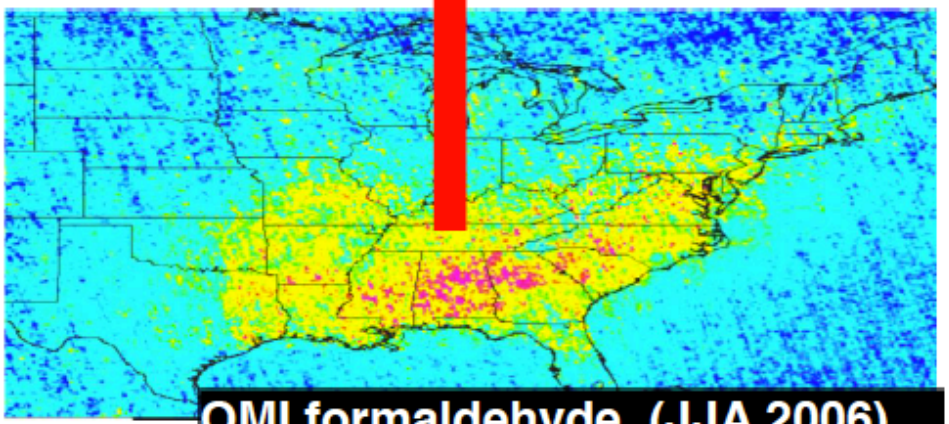
What is the delivery of H_2O, other gases to the lower stratosphere by deep convection, and what are the implications for ozone loss?

tropopause

UT anticyclone

What is the aerosol/chemical aging of convective outflow in the UT anticyclone?

How efficiently are gases and aerosols scavenged in deep convection?



OMI formaldehyde (JJA 2006)

How does human influence affect biogenic VOC (BVOC) chemistry with implications for organic aerosols (OA) and ozone?